DOCUMENT RESUME

ED 129 855 TM 005 475

AUTHOR Holleman, I. Thomas, Jr.
TITLE The Theory of Evaluation with an Emphasis on the Formative Phase.
PUB DATE [75]
NOTE 16p.

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS Data Collection; Decision Making; Evaluation; *Evaluation Methods; *Formative Evaluation; Models; Program Evaluation; School Systems; Summative Evaluation
IDENTIFIERS Context Input Process Product Evaluation Model

ABSTRACT

An overview of educational evaluation theory in general, and its formative phase in specific, is presented. Educational evaluation is defined as are its formative and summative phases and its classifications of external and internal evaluation. Each phase and classification are discussed largely in the context of formative evaluation. In addition, various key aspects of formative evaluation are discussed: key problems, sources of information, activity phases, and types of formative evaluation. (Author/BW)

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I. Thomas Holleman, Jr.

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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THE THEORY OF EVALUATION WITH AN EMPHASIS ON THE FORMATIVE PHASE

Introduction

"Data for decision-making" has appropriately been suggested as the slogan for educational evaluators. Its designation is quite obvious. The emphasis has been and continues to be that "...every type of data collected will contribute to the decision-making process itself." (1) Educational evaluation then finds its modus operandi in the milieu of data and decision making. Fittingly, Stufflebeam and the Phi Delta Kappa National Study Committee on Evaluation defined educational evaluation as "the process of delineating, obtaining, and providing useful information for judging decision alternatives." (6) Thus, educational evaluation is a very complex and comprehensive process of gathering, assimilating, and synthesizing data which in turn is used to adjust, discard, or otherwise change the application of an on-going educational process.

Three processes, then, emerge. They are the evaluation process, the decision making process, and the educational process. In the arena of a local educational system in which each of these processes is operational and fully functioning, theoretically speaking, an equilibrium will exist in which each is complementary of and exists solely for the benefit of the others. In essence, in order for this system to so

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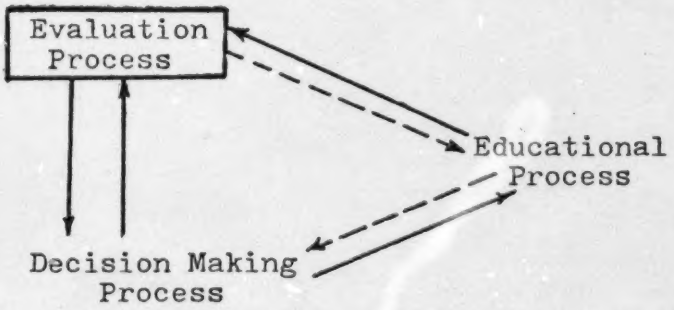
function the evaluation process must provide accurate and valid data which, in turn, is utilized in the decision making process, and results in an on-going educational process.

A process paradigm forms as shown below. The evaluation process as symbolized in the box, is the focal point for this paper; the interrelationship of the three processes will be examined as appropriate. Note that only the evaluation and decision making processes are connected by two solid lines.



Process Paradigm of the Evaluation, Decision Making, and Educational Processes.
Note: The solid lines with their directional indicators illustrate direct interaction between direct processes; the dashes with their directional indicators illustrate an indirect interaction between processes.

The educational process, although not at all isolated from the other two, has both solid and dashed lines connecting it with the decision making process and also similar lines running from the educational to the evaluation process; the dashed lines flow in the opposite direction. This flow indicates only an indirect relationship between the evaluation and the educational process while there is very much a direct relationship between the decision making and educational processes.

The relationship is in terms of final authority and regulatory power. The evaluation unit rarely has any program regulatory authority of a direct nature, but definitely exerts an indirect influence according to the institutionalized chain of command.

Formative and Summative Evaluation

Educational evaluation, especially when considered in the context of a local school system, has been classified into two phases. (5) They are designated formative and summative evaluation. Since any process can be divided into phases, the developmental phase of a program or curricula of the educational process is rightly referred to as formative, and the final or completion phase of a program or curricula of the educational process is called summative. More specifically, formative evaluation refers to the process of judging a dynamic product that can be revised in form since it is still undergoing development. Conversely, summative evaluation is the process of judging a completed product which has been readied for the consumer (i.e., the students, teachers, and administrators) and thus final validation. (1, pp. 390-391)

According to Lawson (3), the major purpose of formative evaluation is to "proffer descriptive and judgmental data which enhance rationality in decision making relevant to the design of instructional products." The purpose of summative evaluation can be worded exactly the same, but with the last phase reading "relevant to the validation of the finalized design of instructional products." From these purpose

statements it can be inferred that the overall purpose of educational evaluation is to derive reliable data for (re) designing and/or validating instructional products or curricula. Lawson (3) has also advised that "information presented to the learner or the instructor only for the conduct of an on-going instruction is not formative." Thus, so-called evaluation efforts which only provide curriculum helps or instructional suggestions really cannot be classified as data provided from a true evaluation endeavor.

Internal and External Evaluation

Closely related to the formative and summative phases of educational evaluation are two classifications of educational evaluation. They are external and internal evaluation. Both classifications are based upon the source of the evaluation effort. Quite simply, external evaluation refers to formative or summative evaluation by an evaluation team employed from outside the local school system; internal formative or summative evaluation refers to an evaluation team employed as an integral unit of the local school administrative staff. (1, pp. 402-403)

The trend of the 1970's appears to be a polarization of internal and external evaluation in terms of the two phases of educational evaluation. Most formative evaluations of local educational systems and programs are being placed in the jurisdiction of an institutionalized evaluation component, while most summative evaluations of local systems and programs

are being intrusted to an external team financed by the local school system or by a state education agency, a university, or the U. S. Office of Education.

However, various large municipal school systems, such as the Dallas (Texas) Independent School District and the Columbus (Ohio) Public Schools, have both formative and summative evaluation phases established on an internal continuing basis. An example of this comprehensive approach to educational evaluation can be seen by an examination of the goals and areas of service delineated by the Evaluation Department of the Columbus (Ohio) Public Schools. The stated goals of this evaluation department are (4):

- To contribute to the improvement of programs, services, operation, and administration of the Columbus (Ohio) Public Schools.
- To contribute to the improvement of communication between and among the Board of Education, employees of the Board, pupils, parents and citizens.
- To help the Board of Education and school administration account to pupils, parents, and citizens for the performance of the entire school and groups of pupils.
- To create, maintain, and improve opportunities for pupils, parents, and citizens to have a broader and more meaningful involvement in school affairs.
- To reflect opinions and attitudes of pupils, parents, and citizens about school affairs to the Board of Education and the administration.
- To reinforce and service specific evaluation and information needs of all other divisions, departments, and schools.

Internal evaluation in smaller school systems, can be

utilized by both federal or state funding agencies as well as provide immense service to the local education agency decision makers. According to Merriman (4), internal evaluation teams have the added advantage of providing for continuity and building a cumulative asset in the local school system.

Aspects of Formative Evaluation

Since most reviews of literature concerning educational evaluation focus largely upon theory, the emphasis will be upon practice in terms of the practical, everyday application of current evaluation theory. This pragmatic approach is appropriate in that the central theme of this study is upon formative evaluation efforts as undertaken in the setting of the local education agency. This transference of theory into practice will be discussed in connection with several important aspects that confront any internal formative evaluation team. These aspects are: key problems, sources of information, plus activity phases and types of formative evaluations.

Key Problems and Factors

Every internal formative evaluation component of a local school system is confronted with problems. These problems may range from the one extreme in which an evaluation team has to deal with a not-at-all unusual situation in which a small suburban school business manager is in charge of curriculum and its selection. At the other extreme, an evaluation team in a large municipal school system might have the problem

of developing and implementing a new social studies program for a recently desegregated student body that is being bused amid strong parental protest. Most internal formative evaluation problems stem from innovations, implementations, and impedimenta. In other words, innovations must be conceived for new or developing programs, these in turn must be implemented, and any impedimenta that results from the innovations and their implementations must be overcome. Five key problem areas can be identified. They are the problem areas of institutionalization, of decision making, of role delineation, of the time-frame, and of evaluation models and methodologies. (7:2) Since each of these key problem areas, if examined thoroughly, would necessitate lengthy discussions, certain pertinent factors related to these areas can be isolated. These factors are examined in the context of the initial institutionalization of a formative evaluation unit in a local school system, and are based on a paper by Walker. (7)

The installer of the formative evaluation system should be sure that the prevailing definition of the system is consistent with his expectations for that system, his ability and competence to install such a system, and his philosophy as to what ends should be served by an evaluation system.

The evaluator must know who the decision makers are. The most common and most hazardous way of identifying them is to look at organizational charts depicting lines of formal authority. These charts do not show informal lines of communication and authority. Difficulties in identifying

decision makers are compounded since the decision making structure is fluid and the structure always operates on both the formal and the informal levels. In addition there are different types of power (action and veto, direct and indirect).

In designing an evaluation system, the evaluator must delineate information sources, methods of retrieval, and techniques for providing the information. An evaluator must know the criteria on which decisions are based, and must determine the critical criteria necessary for the information to be provided.

The evaluator and the decision maker must agree on the content, scope, and time frame of the information. The decision maker must state clearly the population with which he is concerned, the degree of confidence he must attach to the findings and how generalized the information should be. These statements have implications for sampling methods, analysis techniques, and resources required. The decision maker must also specify the time scope of the evaluation process.

Another concern of the formative evaluator is provision for the storage and retrieval of data that is beyond the specifications of the decision maker in order to be prepared for unpredictable information contingencies. This contingency information is of great importance if the local school system is oriented to the future and the concept of educational innovation and change. Of course the organizational structure must possess the flexibility to maintain this posture. This

information would ideally supply the decision maker with future alternatives and desirable strategies for their attainment.

Some educators still equate evaluation with research; however, evaluating under research conditions means working under unrealistic controls, obtaining meaningful results at the completion, assuming or forcing comparisons of subjects, and limiting the alternatives to either acceptance or rejection of the hypotheses. Fortunately, there are many quasi-experimental models that evaluators can use for their purposes. While experimental in design, they have been adapted to the actual situation being analyzed.

Sources of Information

According to various evaluation authorities, there are three sources of formative evaluation data. (3, p. 44; 7, p. 115) These sources are usually referred to as internal, external, and contextual. Internal information is data formulated by analyzing the instructional program being formulated in terms of its physical characteristics, content, and format. External information is data derived by analyzing the effects of the educational program or its components upon the behaviors of those individuals directly connected with it. In other words, learners, instructors, parents, and other groups are evaluated for cognitive, affective, and behavioral inputs and outcomes of instructional programs. Contextual information is derived by examining the conditions under

which the instructional program and its materials are expected to function. Typical examples of contextual sources for an instructional program would be learners, psychological and sociological characteristics as well as those of the instructors, and classroom dynamics and environment.

The data or information, once gathered and compiled, can be sorted into two categories. According to Baker and Alkin (1, p. 408), the first category is information about the effects of the educational program. In the formative evaluation phase these data give a read-out on the effectiveness of the program in meeting its goals. The best source data for this category are student performance on the criterion set of tasks. This would be done usually in light of comparison with student pretest scores. In addition, learner opinions concerning program objectives, course content, and instructional quality can give important clues as to the program's effectiveness. Free discussion interviews or open ended questionnaires can be used for gathering this data.

The second category of information is that which is diagnostic in nature and can be relayed to and used by the curriculum developer in altering the program during the formative stage. The data should be so used that the probability of program success increases with each additional trial, and program deficiencies are remedied and decreased as discovered. Baker and Alkin (1, p. 409) suggested several techniques in gathering these data. For example, expert judgment is recommended in the period when product specifications are being

developed. The utilization of a panel of judges can be profitable in two areas. First, they can render expert judgment through the review process. Materials can be submitted to them as they are prepared and their suggestions can be incorporated during the critical formative stages. Second, as a panel of judges, they can be convened as a group. In this situation, Delphi techniques and scenario writing can be utilized to draw upon their pooled resources. Both techniques are based conceptually upon the well-known process called brainstorming.

Program response data is also recommended for gathering diagnostic information. (1) This involves, for example, a study of the pattern of errors made by learners on practice exercises. In addition, any records of student behavior that give clues from his pre-program experiences should be analyzed. The students responses to particular instructional phases and devices can also be monitored for data. In fact, program-critique data derived from student opinions have proven valuable. Three ways are suggested for obtaining this information (1):

> First, learners may be instructed to circle difficult words, write comments, or place question marks in the materials that they are exposed to. If materials do not present printed material, then periodic, brief formative checks might be made at regular intervals, where the learner is asked to provide answers to questions similar to those listed above. Or single learners may be queried as they proceed through the program. A third source is a post-instructional diagnostic questionnaire, where students are asked to give their analyses and suggestions

for revision of the sequence. An interview can also provide information that should enable the developer to identify particular aspects for revision.

Formative Evaluation Concepts

The book produced by Stufflebeam and the Phi Delta Kappa National Study Committee on Evaluation (6) covers the entire evaluation spectrum. Its basic contents apply to both formative and summative evaluation efforts. This final section gives an overview of the CIPP (context, input, process, product) model as presented in the book and briefly summarizes its major stages as related to formative evaluation.

Continuous evaluation is the key to the CIPP model. It includes several basic activities:

- Creating a proper climate for evaluation.
- Training personnel to become sensitive to decision making stimuli.
- Emphasizing decision making for all project personnel.
- Collection of data for feedback.
- Management of operations.

Directors of evaluation efforts have the task of creating a proper climate for evaluation. Therefore, chief evaluators are not data collecting technicians but managers providing plans for evaluation activities. Evaluators must train personnel to help and must also train them to be appreciative of decision making alternatives. They must also be able to

establish criteria and methodologies for directing the evaluation effort, delineating the kinds of data needed, the manner in which they will be collected, the personnel who will collect the information, and the proper manner of utilizing the data to solve problems and offer alternatives. Formative evaluators should continue to be involved with the program throughout its progress toward the final product. CIPP refers to the various stages of a program's progression to completion.

The context, input, process, and product (CIPP) stages of program evaluation are partitioned as follows:

- Context evaluation is concerned with the setting or the environment in which education is taking place. It includes the community, children, teachers, buildings, and present approaches used for teaching. The basic question of concept evaluation is -- What are the needs that should be satisfied?

- Input evaluation translates the decision made under context to specific objectives and procedures for achieving the general objectives implied in the context decisions. The basic question of input evaluation is -- What are the best means to solve the need or the problem?

- Process evaluation is an examination of the program as it functions to see if the program plan meets expectations or if modifications should be made in operations. This kind of evaluation not only wants to see whether everything works or not, but also wants to provide an avenue for making modifications wherever the need indicates.

- Product evaluation analyzes the results to see if the objectives of the project were met. Some evaluators refer to this kind of assessment as summative evaluation.

The comprehensiveness of the CIPP Model makes it

applicable to a wide range of situations and contingencies. It has been utilized in its totality by various municipal school systems. Smaller schools, with limited budgets for evaluation can profit from the model's adaptability. They can utilize any of its stages for any given evaluation task that might present itself. The only limitations imposed upon an evaluation effort's effectiveness are the common limiters of time, money, and expertise. Granted the proper amounts of resources, an evaluation effort's success hinges upon the proper relationships established among the evaluation, decision making, and educational processes.

An overview of educational evaluation theory in general and its formative phase in specific was presented. Educational evaluation was defined as was its phases of formative and summative evaluation and its classifications of external and internal evaluation. Each phase and classification were discussed largely in the context of formative evaluation. In addition, various key aspects of formative evaluation were discussed -- key problems, sources of information, activity phases, and types of formative evaluation.

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